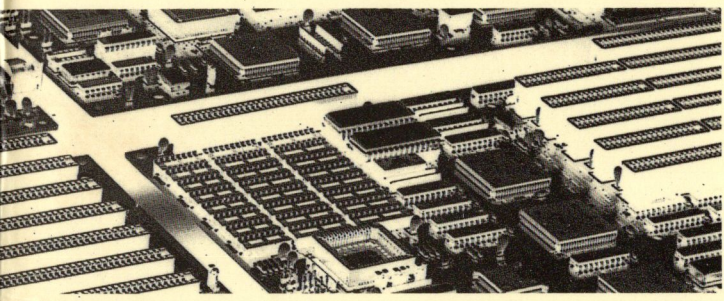
WH 386sx



USER'S MANUAL

INTRODUCTION

This manual has been designed to be useful for several purposes. If the WH 386sx is already set up in functioning system, it will be helpful to review the manual to become familiar with the features of the board and where things are. This will be helpful in the unlikely event there is a problem with the system.

For those who want to alter the board's configuration or to upgrade it, the manual will serves as a guide to both procedure and specifications. While the necessary information is included in the manual, we recommend that unless you feel confident of your ability to do the work, it would be best to have your dealer or a local service shop do it. Before making alterations to the system, check to see that doing so will not violate the system warranty. If it does, have the work done by an authorized dealer.

The "chipset" consists of advanced Winbond WATCH W83C311F, W83C312F chipsets, which incorporate most of the logic required for a low-cost, highly integrated IBM PC AT-compatible computer.

IMPORTANT: The chipset requires correct configuration information; otherwise a malfunction may result.

CAUTION: Static electricity can cause serious damage to integrated circuit chips. To avoid building up a static electric charge on your body, touch a grounded object before touching the chips and at frequent intervals as you handle the chips. If chips are handed from one person to another, the two should touch hands first, then pass the chips.

Information presented in this publication has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies. The information contained in this document is subject to change without notice.

Contact your dealer for warranty details.

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Chapter 1
Introduction

This chapter covers the general specifications and features of the WH 386sx, as well as their major components, including the CPU, brief specifications of Winbond WATCH Chipset, etc.

1.1 General Specifications and Features

The WH 386sx mainboard is based on the powerful 80386SX microprocessor and incorporates advanced computer technology to meet the requirements of the next generation operating systems and applications. Yet it retains full compatibility with the original IBM PC/AT and uses existing PC software and hardware.

• Microprocessor	Support 16, 20, 25, 33 MHz 80386SX.
• Coprocesspor	Socket for 80387SX.
• Chipset	Winbond WATCH PC/AT Chipset. W83C311 (Advanced Bus Controller). W83C312 (Intetrated Peripheral Chip).
• Architecture	IBM PC/AT compatible.
• Memory	Support 512KB to 16MB on board, 4 x 30-pin SIMMs module (JEDED). Support 256KB/1MB/4MB DRAM module. 1 or 2 bank page mode operation. Support shadow RAM function for system/video BIOS.
• Pipeline	Support non-pipeline/pipeline operation.
• Cache	Support 16 / 64KB cache memory. Direct-mapped cache organization. Zero wait state during cache read hit cycle. Support two non-cacheable blocks of from 16KB to 4 MB in size. Support posted-write DRAM updating strategy.
• BIOS	AMI single EPROM.
• Refresh	Flexible refresh timing. AT style refresh. decoupled refresh. Slow refresh option.
• Expansion	Five 16-bit ISA slots. One 8-bit ISA slot.
• Form Factor	Half AT size, 4 - layer XT/AT mounting capability.

1.2 Major Components

The WH 386sx mainboard is composed of many integrated circuits, chips, jumpers and connectors. (Please refer to Figure 3.1)
The major components and their basic features and functions are outlined below:

■ CPU (Central Processing Unit)

The central processing unit is the brain of a computer system that interprets and executes instructions, such as performing calculations, routing information, and temporarily storing data. In personal computers, the CPU is a highly integrated chip called **microprocessor.**

■ Winbond WATCH Chipset

The Winbond WATCH PC/AT chipset is designed for high performance 80386SX-based PC/AT systems running at 16/20/25/33 MHz. This chipset is composed of two ICs: the W83C311 Advanced Bus Controller and the W83C312 Integrated Peripheral Chip.

The W83C311 integrates all of the logic circuits needed for cache memory control, on-board DRAM control, AT bus access control, data buffer control, and CPU interface control. The W83C312 integrates a DMA controller, interrupt controller, timer/counter, page register, and address buffer.

■ Math Coprocessor Socket

For optimal performance, the rated speed of 80387SX should be the same as the CPU's.

■ BIOS

The WH 386sx is intentionally designed to use a single EPROM chip for the system instead of the conventional 2-chip design. In addition to reducing space and cost, it allows the user to enable the BIOS shadow feature for access to the fast DRAM, instead of the slow EPROM chip.

■ Jumpers

There are several jumpers on the mainboard which should be properly set according to the system configuration.
Detailed information regarding all jumpers can be obtained from Chapter 3.

■ Connectors

Several connectors are used to connect the power supply, keyboard and LED indicators. Refer to Chapter 3 for more information.

■ Slots

One 8-bit and five 16-bit I/O slots are provided for inserting add-on cards, including cards for monitors, disk drives, etc.

Chapter 2
Memory Configuration

The WH 386sx DRAM configurations are discussed, followed by DRAM module installation and removal. Users are recommended to read through this chapter before installing or removing memory.

2.1 System Memory

The WH 386sx provides tremendous flexibility to support a lot of different on-board DRAM configurations. The on-board DRAM is installed with SIMMs (Single-In-Line Memory Module). There are two banks of DRAM module slots seated on the WH 386sx to support up to 16MB on-board memory.

The location and layout of all the SIMM banks are illustrated in Figure 3.1:

Each bank is composed of two standard 30-pin SIMM sockets, which take 256 KB, 1 MB or 4 MB SIMM. All of the two SIMMs within a bank must be of the same type; you can not mix 256 KB, 1 MB and 4 MB modules in the same bank.

The total size of on-board memory depends on the combinations of different types of DRAM modules installed on the memory banks. The table below lists all the possible DRAM module combinations and the total memory amount for each option.

Option	Bank 0	Bank 1	Total Memory
1	256 K	None	512 K
2	256 K	256 K	1 MB
3	1MB	None	2 MB
4	1 MB	1 MB	4 MB
5	4 MB	None	8 MB
6	4 MB	4 MB	16 MB
7	1 MB	256 K	2.5 MB
8	4 MB	1 MB	10 MB

The WH 386sx accepts optional 16KB or 64KB of SRAM for cache memory support. The SRAM chip should be 8K x 8 bit or 32K x 8 bit. The TAG RAM

is for addressing code or data from main memory to cache memory. The table below lists all the posssible cache size selections.

Option	Cache SRAM (U22,U23)	TAG RAM (U21)
16 KB	8K x 8 bit	8K x 8 bit
64 KB	32K x 8 bit	32K x 8 bit

Note: If the cache SRAM is installed, the DRAM should be used a speed rating of 70 ns.
If the cache SRAM is not installed, the DRAM should be used a speed rating of 60 ns.

2.1.1 DRAM Module Insertion

The SIMMs must be seated on the sockets as firmly as possible, and because of the fragility of the slot, you must be careful when inserting or removing the module.

1. Align the module so the pin-1 marking and corner notch of the module correspond to the SIMM socket pin 1 marking at the rear of the board. The module can fit in the socket one way only. Do not force it!
2. Push the module against the clip arms with your thumbs until a "click" sound is heard; the little plastic tabs appear in the latching holes on the RAM module board and the clip arms fully grab the module board.

2.1.2 DRAM Module Removal

If possible, use a SIMM extraction tool; otherwise use the following method:

1. Carefully use your thumbs to bend outward the plastic tab ends on both sides of the slot.
2. The RAM module board is automatically ejected off the clip arms.
3. Take it out of the socket.
4. Repeat steps 1 through 3 to release the other RAM modules.

Chapter 3
Jumper Settings and Connectors

This chapter will assist you in setting up the WH 386sx before you install it in a system case. If your WH 386sx has already been installed and you do not wish to change the configuration settings, just skip over this section.

3.1 Jumper Settings

The WH 386sx has several jumper switches that must be set to define a system configuration. They are turned off and on by placing or removing a cover cap over the pins. This is called an opened or a closed jumper. All jumpers must be set to one of the possible two settings.

Please refer to Figure 3.1 for the location of the jumpers and connectors.

The table below summarizes the function and settings of each jumper on the WH 386sx mainboard.

Function		Jumper Setting
Type of display adapter	Monochrome	**JP1** pin 1,2 closed
	Color	**JP1** pin 2,3 closed
Pipeline Setting	Nonpipeline Cache	**JP7** opened
	Pipeline	**JP7** closed
Cache SRAM Size	16 KB	**JP5** pin 2,3 closed
	64 KB	**JP5** pin 1,2 closed
System Clock Selection	CLK2IN/4	**JP4** pin 1,2 closed **JP6** pin 1,2 close
	CLK2IN/5	**JP4** pin 2,3 closed **JP6** pin 2,3 closed
	CLK2IN/6	**JP4** pin 2,3 closed **JP6** pin 1,2 closed
	CLK2IN/8	**JP4** pin 1,2 closed **JP6** pin 2,3 closed

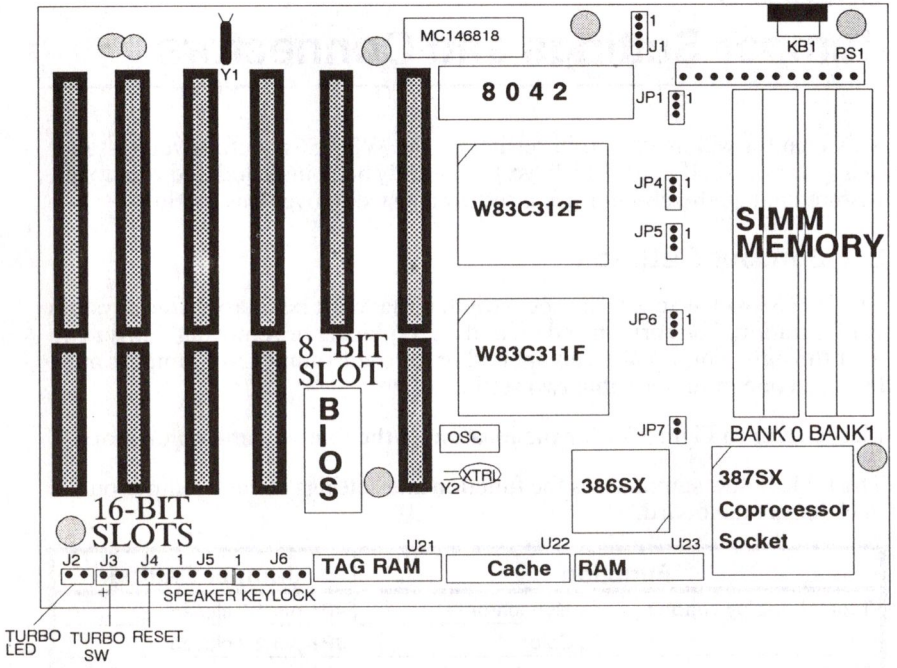


Figure 3.1 Board Layout

3.2 Connectors

There are several connectors located on the WH 386sx mainboard. They are used to connect with some peripheral devices to enhance the system performance.

Refer to Figure 3.1 for the positions of all the connectors on the mainboard. Their functions are listed below:

Connector	Function
KB1	Keyboard Connector
J1	Battery Connecotr
J2	Turbo LED Connector
J3	Turbo Switch Connector
J4	Hardware Reset Connector
J5	Speaker Connector
J6	Power LED Connector and KeyLock

Chapter 4
Built-In BIOS Setup Program

This chapter provides detailed instructions on how to configure your system using the Built-In BIOS Setup Program and gives some technical information about your computer. If you are not very familiar with microcomputers, please carefully read this chapter before proceeding. If you do not want to change the system's configuration, just skip this chapter.

Before you start to add optional devices to your system, you should first learn how to setup your system and adjust its jumpers (Refer to Chapter 3 for detailed information). Running the Setup Program of the WH 386sx takes place after all Jumper setting adjustments have been completed. You should at that time record what the configuration is and keep it for reference.

4.1 Setup Summary

1. Install any extra memory SIMMs.
2. Set jumper JP1 for color or monochrome monitor.
3. Make all connections to board
4. Install control cards, monitor, and any peripheral devices and drivers.
5. Turn-on system.
6. At setup prompt, press the **DEL** key.
7. Type the password if you set the password checking option to "Setup" or "Always" in the Advanced CMOS Setup program.
8. Choose Standard CMOS, Advanced CMOS or Advanced Chipset Setup.
9. Follow screen prompts.

4.2 BIOS Setup

Every AT-compatible computer has battery-supported CMOS memory otherwise called "non-volatile RAM." It stores information about your computer and peripheral device configuration. Unlike ordinary RAM, it retains the information even after you turn off your computer.

A computer needs to know certain things about itself so it can operate correctly when powered on. A special type of software called BIOS (Basic Input Output System) is contained in read-only memory (ROM) chips on the mainboard. The BIOS reads information from the CMOS memory everytime you power on the computer. It then instructs the CPU and other devices to operate according to this information. If the information it retrieves is incorrect or insufficient, the system may not be able to operate properly until accurate information is supplied. You do this by means of the SETUP program built in the system BIOS.

4.2.1 When Should You Run Setup?

1. Although someone may have set up the system for you, you may want to adjust the system to fit your needs.
2. Whenever you change some components in your system. For example, if you add a hard disk or more memory, you must run Setup to record the new system configuration. If you don't do so after adding memory, the computer will prompt you to run Setup.
3. The last and most unlikely possibility is the loss of information in the CMOS memory. You may never encounter this situation, but if you do, you can restore the information by running Setup.

4.2.2 How to Recall the Setup Program

You can run the built-in SETUP program in several ways:

1. When powering-on the system
   When you turn on the system power, or press the reset button on the system case while the system is running (not every system has this button), the BIOS will first test the functionality of the system components and display a start-up message similar to the following:

   ```
   XXXX KB OK
   Hit <DEL> key,If you want to run Setup
   ```

   The numeral digits will continue to count at the top left of the screen. This represents the BIOS testing the mainboard memory chips. Before the above message disappears, you can press the **<DEL>** key to run the Setup program.
2. To reset the system
   By pressing **<Ctrl> <Alt> <Del>** key combination when the system is up and running (assuming you are running under DOS or other environments that support this feature), the system will immediately reset itself and boot up. Before booting up from a diskette or hard disk, you can also see the below start-up message :

   ```
   Press <DEL> key,if you want to run Setup
   ```

3. When the BIOS prompts you
   In the self-test process, if the BIOS detects inconsistent or incorrect configuration information, or some physical system error, it will display an error message on the screen, and prompt you to take action; for example:

   ```
   Run SETUP UTILITY
   Press <F1> to RESUME
   ```

   Press the **<F1>** key and continue.

4. To Enter password
   If you set the password checking option to the "Setup" or "Always" field in the Advanced CMOS Setup program, after pressing the **"DEL"** key to run the Setup program. it will display the Enter password message on the screen. Refer to section 5.6, Using the Change Password Setup.

4.2.3 Running the SETUP Program

When you call up the Setup program, the screen displays a "main menu" similar to the following:

On-screen instructions at the bottom of the screen explain how to use the program.

The following is a brief description of the six options of the Setup main menu:

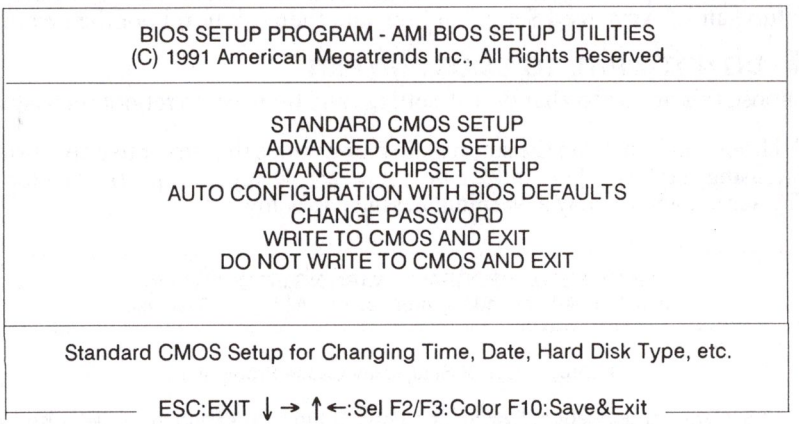


Figure 4.1 BIOS Setup Main Menu Options

■ STANDARD CMOS SETUP

Display the standard CMOS Setup screen to check or modify general configuration information. The standard CMOS setup for the date, time, floppy type, hard disk type, video type, etc.

■ ADVANCED CMOS SETUP

The ADVANCED CMOS SETUP option is used to set the various system options for the user, including the above 1 MB memory test, Scratch RAM area for BIOS, Coprocessor detection, Video ROM Shadow and System ROM Shadow.

■ ADVANCED CHIPSET SETUP

This Setup option is for the user who wishes to program the chipset registers. The chipset registers control most of the system options in the computer.

■ AUTO CONFIGURATION WITH BIOS DEFAULTS

This option allows for automatic configuration of all the options in the Advanced CMOS Setup/Advanced Chipset Setup with the BIOS defaults.

■ CHANGE PASSWORD

The password is required for entering the Setup program or boot your system. The user can change the ROM default or current (user) password stored in the CMOS by accessing this option. The ROM default password is the <Enter> key.

■ WRITE TO CMOS AND EXIT

Choose this option to save the changes you have made in the "Standard Setup" and " Advanced Setup" option, and then exit to reboot the system.

■ DO NOT WRITE TO CMOS AND EXIT

Choose this option to abandon all settings and then exit to reboot the system.

To choose an item from the setup main menu, move the cursor to appropriate line using the Up< ↑ > and Down< ↓ > arrow keys and press <Enter>. The screen will display a warning message as below:

```
BIOS SETUP PROGRAM - WARNING INFORMATION
(C) 1991 American Megatrends. Inc., All Rights Reserved

Improper Use of Setup May Cause Problems!!

If System Hangs, Reboot System and Enter Setup by Pressing the <Del> Key

Do Any of the Following After Entering Setup
   (i) Alter Options to Make System Work
   (ii) Load BIOS Setup Defaults
   (iii) Load Power-On Defaults

Hit <ESC> to Stop Now, Any Other Key to Continue
```

Figure 4.2 BIOS Setup Warning Message

4.3 Running the Standard CMOS Setup

To check or modify the general system configuration, choose "STANDARD CMOS SETUP" from the Setup main menu and press < Enter >. The screen will display the following screen:

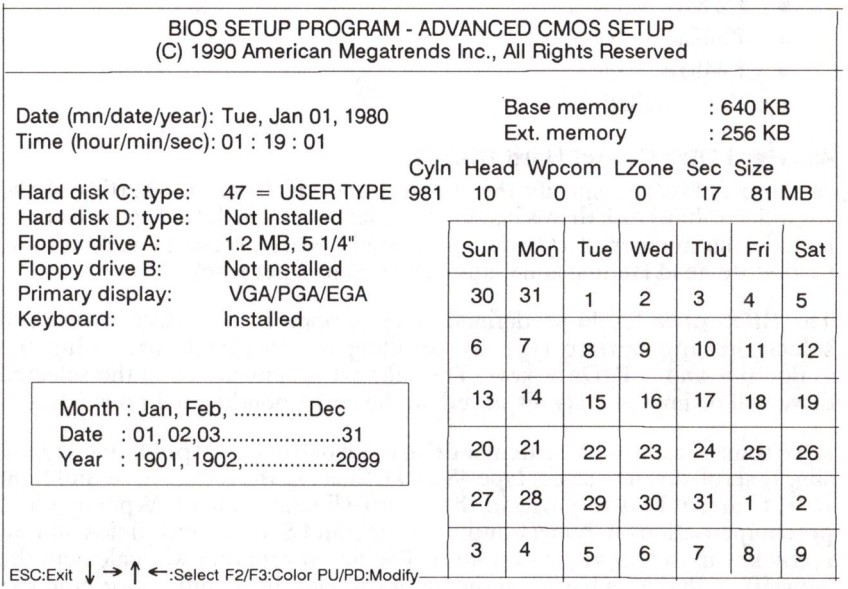


Figure 4.3 The Standard CMOS Setup Program Screen

On-screen instructions in the lower left corner of the screen explain how to use the program. After making all selections, press <**ESC**> key and then return to the main menu program to choose another Setup program.

■ Date

In the Date fields, you manually set the electronic calendar on the mainboard only if the values are incorrect.

■ Time

Time fields include hour, minutes, seconds, but you can only set the value of hour and minute. Check and adjust these fields according to your clock or wrist watch.

■ Floppy Drive A and B

In this field, you may specify the capacity and format of the floppy drives installed in your system:

- 360KB, 5 1/4"
- 1.2 MB, 5 1/4"
- 720KB, 3 1/2"
- 1.44MB, 3 1/2"
- Not Installed

■ Hard Disk C: and Hard Disk D:

In these fields, you specify the physical and electronic properties of the "Standard" hard disk drives installed in your system. Relevant specifications include the number of cylinders and heads, write precompensation time, read/write head landing zone, number of sectors per track.

The BIOS provides 46 predefined types of popular hard disk drives. You select the appropriate type by scrolling forward/backward using the <PgUp> and <PgDn> keys. The relevant specifications of the selected drive will be immediately displayed on the corresponding field positions.

If for some reason your particular drive is not one of the 40 predefined types, simply scroll down to select type 48 or 49, then use the left <← > and right <→ > arrow keys to move to the Cyln(Cylinders), Head, Wpcom(Write precompensation), LZone(Landing Zone), and Sec(Sectors) fields and directly key in the appropriate values. The Setup program will calculate the capacity of the drive based on the input cylinder, head and sector numbers and display the result on the capacity field for your refence.

Refer to Appendix A for the table of hard disk types.

■ Primary Display

In the display field, you specify the display adapter installed in your system.

■ Keyboard

This setting is used to select "Installed" or "Not Installed" for the keyboard during the Power On Self Test. Normally it should be set as "Installed".

4.4 Running the Advanced CMOS Setup

When you choose the "RUN Advanced CMOS Setup" option in the Setup main menu, the screen displays the following menu:

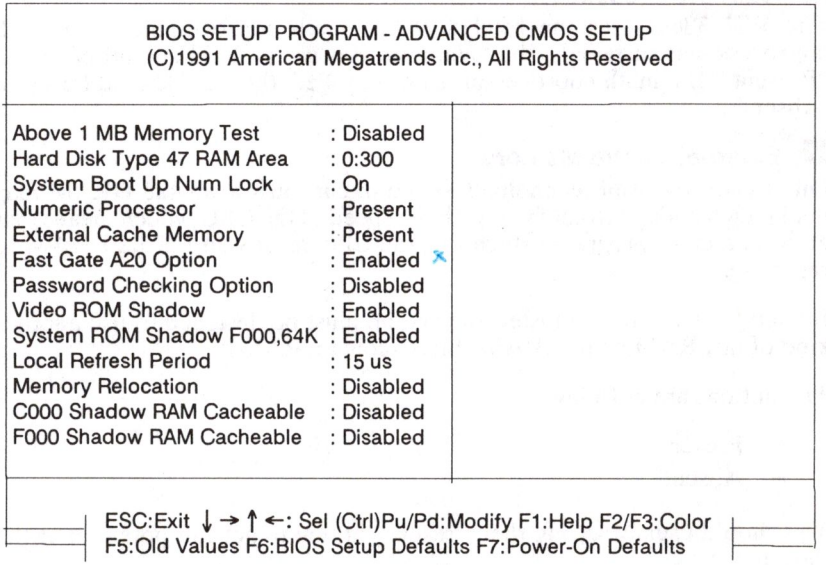


Figure 4.4 The Advanced CMOS Setup Program Screen

■ Above 1 MB Memory Test

You can disable this option to bypass the memory test if a lot of memory is installed in the system, or enable this option to test all the memory.

■ Hard Disk Type 47 RAM Area

The purpose of this field is to specify the address of the memory area used by the system BIOS for storing extended information, such as to save the user definable drive type 47. The available options are:

- 0:300
  To reserve the stack area at address 30h:0.
- DOS 1KB
  To reserve the top 640 KB in the DOS base memory, and reduce the size of base memory by 1 KB.

The default is option "0:300".

■ System Boot Up Num Lock

This option can be set "Num Lock" key to "On" or "Off" after system boot up.

■ Numeric Processor

The WH 386sx uses the Intel 80387SX math coprocessor. If a math coprocessor is installed , the "Numeric Processor" field should be set to "Present". If a math coprocessor is not installed, this field should be set to "Absent".

■ External Cache Memory

Due to constraint of technologh, speed of currently available DRAM may not be high enough to catch up with the speed of the CPU, which means that at every step of program extecution, the CPU must wait for the DRAM to response.

In fact, for CPU to run faster, the system must be designed to use another kind of fast RAM chip - SRAM (Static-colunm RAM).

The options are as follows:

- Present
- Absent

You should usually setting the "Present" option to get full potential of the system.

■ Fast Gate A20 Option

The "Gate A20" is a special controllable switch existing in AT class machine, to boost performance of software utilizing 80286 protected mode, such as OS/2, UNIX, ...etc. Program intends to utilize extended memory must issue special command to enable this gate and make extended memory access-able.

If this option is enabled, the A20 address is enabled after power on.

■ Password Checking Option

The purpose of this field is to determine whether the password is asked for in every boot (set to "Always"),when entering into the Setup program (set to "Setup") or never (set to "Disabled").

■ Video ROM Shadow

Choose these two options for better video display performance. It enables the shadow RAM operation for the video BIOS on display cards such as VGA or EGA. If it has no ROM in the display card, there is no need to shadow the Video BIOS.

■ System ROM Shadow F000,64K

This option enables the shadowing of the system BIOS(addressed between F0000 - FFFFFh, 64KB) . You are recommanded to enable this option for proper BIOS performance.

■ Local Refresh Period

The WH 386sx allows the refresh period to be programmed to be 15, 30, 60 or 120 μsec depending on the type of DRAM used. The AT-compatible refresh period for the on-board memory cycles and the AT-bus memory cycles is 15μsec. You should usually setting the "15us" option to enhance the system performance except for some DRAM which cannot support this refresh period.

■ Memory Relocation

This option enables or disables the system to map the unused 384 KB reserved memory to address above the top of memory. If the shadow RAM is completely disabled, all 384KB of memory between A0000h and FFFFh may be relocated. When the memory between C0000h and DFFFFh is shadowed, only the 128KB of memory in A0000h-BFFFFh that is not shadowed can be relocated.

■ C000 Shadow RAM Cacheable

If you have shadowing of the video BIOS, you can enable this RAM Cacheable function.

■ F000 Shadow RAM Cacheable

If you have shadowing of the system BIOS, you can enable this option for RAM cacheable function.

4.5 Using the Change Password Setup

To change the password, choose the "CHANGE PASSWORD" option form the Setup main menu and press <Enter>.

1. If the CMOS is bad or this option has never been used, there is default password which is stored in the ROM. The screen will display the following messages:

   ```
   Enter ROM Password:
   ```

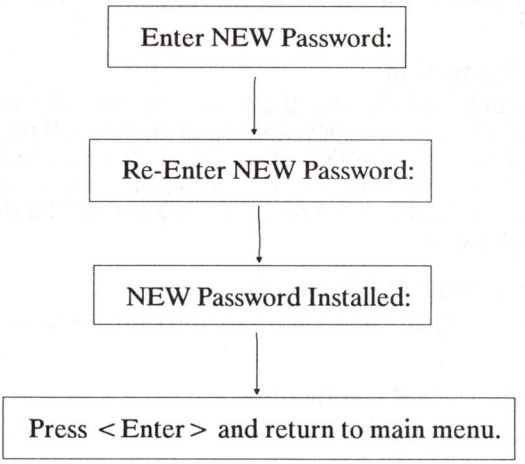
   Press the <Enter> key and continue to change the password.

2. If the CMOS is good or this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following messages:

   ```
   Enter Current Password:
   ```

   Enter the correct password and continue to change the password.

3. After pressing the <Enter> key (ROM password) or current password (user-defined password), you can change the password stored in the CMOS. The password can be at most 6 characters long. To change the password, please follow the following steps:



4.6 BIOS Errors and Messages

After entering setup choices, the system will reboot. The setup summary and system information will appear on screen, along with messages. These may include ERROR messages concerning the system or setup.

AMI BIOS performs various diagnostic tests at the time the system is turned-on. Whenever an error is encountered during these tests, there will be either a few short beeps or an error displayed on the monitor. If the error occurs before the display device is initialized the system reports the error with several short beeps.

If the error is FATAL, the system halts after reporting the FATAL error. If the error is NON-FATAL the process continues after reporting the error.

4.6.1 Fatal Errors Through Beeps

These errors are conveyed through a number of beeps.

Beep Count	Meaning
1	DRAM Refresh Failure
2	Base 64 KB RAM Failure
4	System Timer Failure
5	Processor Failure
6	Keyboard Controller-GATE A20 Error
7	Virtual Mode Exception Error
9	ROM-BIOS CheckSum Failure

4.6.2 Non- Fatal Errors Through Beeps

These errors are conveyed as one long beep followed by several short beeps.

Beep Count	Meaning
3	Conventional and Extended Memory Test Failure
8	Display Test and Vertical and Horizontal Retrace Test Failure

4.6.3 Fatal Errors Shown in Display

When these errors are displayed, the screen is cleared, and the error message display is followed by a line saying **SYSTEM HALTED**.

1. **CMOS INOPERATIONAL**: indicates failure of CMOS shutdown register test
2. **8042 GATE-A20 ERROR**: error in getting into protected mode
3. **INVALID SWITCH MEMORY FAILURE**
4. **DMA ERROR:** DMA controller page register test failed
5. **DMA #1 ERROR:** DMA Unit 1 register test failed.
6. **DMA #2 ERROR:** DMA Unit 2 register test failed.

4.6.4 Non- Fatal Errors In Display

There are two types of errors in this category:

1. Ones that require you to press the **F1** key and give you the option of running SETUP.
2. Ones that require you to press the **F1** key and don't give you the SETUP option.

4.6.5 Errors With Setup Option

1. **CMOS battery state low** indicates failure of CMOS battery or a failure in the set and checksum tests
2. **CMOS system options not set** indicates failure of CMOS battery or a failure in set and checksum tests
3. **CMOS checksum failure** indicates CMOS battery low or a failure in set and checksum tests.
4. **CMOS display type mismatch** indicates failure of display verification.
5. **CMOS memory size mismatch** indicates system configuration and setup failure.
6. **CMOS time & date not set** indicates system configuration verification error and setup error (in timer).

4.6.6 Errors Without Setup Option

1. **CH-2 timer error** indicates channel 2,1,0 timer test failure
2. **Keyboard error** indicates keyboard test failure
3. **KB/Interface error** indicates keyboard test failure
4. **Display switch setting not proper** indicates display type verification error
5. **Keyboard is locked.... Unlock it**
6. **FDD controller error** indicates system configuration verification error in diskette setup
7. **HDD controller failure** indicates system configuration verification error in hard disk setup
8. **C:Drive error** indicates hard disk setup error
9. **D:Drive error** indicates hard disk setup error
10. **D:Drive failure** indicates hard disk failure.

Appendix A

Hard Disk Types

Type	Cylinders	Heads	Write-Precomp	Landing Zone	Sectors	Capacity (Mbytes)
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	31
4	940	8	512	940	17	62
5	940	6	512	940	17	47
6	615	4	65535	615	17	20
7	462	8	256	511	17	31
8	733	5	65535	733	17	30
9	900	15	65535	901	17	112
10	820	3	65535	820	17	20
11	855	5	65535	855	17	35
12	855	7	65535	855	17	50
13	306	8	128	319	17	20
14	733	7	65535	733	17	43
15	000	0	000	000	17	00
16	612	4	0000	663	17	20
17	977	5	300	977	17	41
18	977	7	65535	977	17	57
19	1024	7	512	1023	17	60
20	733	5	300	732	17	30

Table A.1 AMI BIOS Hard Disk Types

Table A.1 AMI BIOS Hard Disk Types Continued

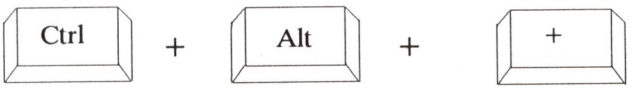
21	733	7	300	732	17	43
22	733	5	300	733	17	30
23	306	4	0000	336	17	10
24	325	7	0000	925	17	54
25	925	9	65535	925	17	69
26	754	7	754	754	17	44
27	754	11	65535	754	17	69
28	699	7	256	699	17	41
29	823	10	65535	823	17	68
30	918	7	918	918	17	53
31	1024	11	65535	1024	17	94
32	1024	15	65535	1024	17	128
33	1024	5	1024	1024	17	43
34	612	2	128	612	17	10
35	1024	9	65535	1024	17	77
36	1024	8	512	1024	17	68
37	615	8	128	615	17	41
38	987	3	987	987	17	25
39	987	7	987	987	17	57
40	820	6	820	820	17	41
41	977	5	977	977	17	41
42	981	5	981	981	17	41
43	830	7	512	830	17	48
44	830	10	65535	830	17	69
45	917	15	65535	918	17	114
46	1224	15	65535	1223	17	152

Appendix B

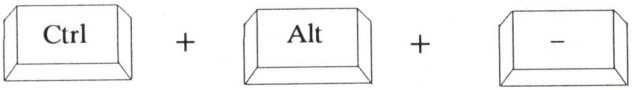
Setting the System Speed

There are two methods to select the system processing speed. You can change the speed during operation while you are working with your application program.

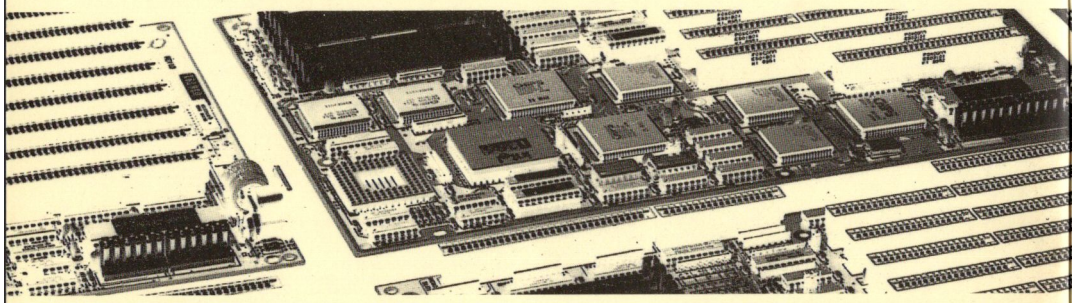
High Speed



Low Speed



* "+" means one must press the keys simultaneously.



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